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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,329	12/06/2001	Stephen Mark Keating	450110-03719	9870

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EXAMINER
KRONENTHAL, CRAIG W

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/006,329	KEATING ET AL.
	Examiner	Art Unit
	Craig W. Kronenthal	2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 March 2005_.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-8, 10-14 and 16-25_ is/are rejected.

7)☒ Claim(s) _9, 13 and 15_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _06 December 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed March 7, 2005, has been entered and made of record.

2. The rejection of claims 7-9 under 35 USC § 112 has been withdrawn in view of the amendment to claim 7.

Response to Arguments

3. Applicant's arguments with respect to claim 1 have been fully considered but they are not persuasive. Applicant argues in essence that the term "field" is well-known in the art. The examiner disagrees and indicates that the term "field" alone within the art of image processing may have many meanings. For example, image fields often refer to separate areas of the same image, as can be demonstrated by searching Google and/or similar search engines. As the applicant has pointed out, this was the interpretation used in applying the Wakasu and Hayashi references. Only when the term "field" is used in the context of interlaced scanning does it have the well-known meaning as the applicant argues. It is noted that the features upon which applicant relies (i.e., fields generated from an inter-laced scan) were not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Objections

4. Claim 13 is objected to because of the following informalities:

- On line 2 of claim 13, the phrase "such as" renders the claim indefinite because it

    is unclear whether the limitations following the phrase are part of the claimed

    invention. See MPEP § 2173.05(d).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 11, 13, 16, 17, 19, and 22-25 are rejected under 35 U.S.C. 102(e) as

being anticipated by Satoh et al. (PN 6,175,639). (hereinafter Satoh)

Regarding Claims 1, 16, 19, and 22-25: Satoh discloses an image processing

apparatus operable to embed data into an image, said image comprising a frame of

image data (Fig. 1, 101), said frame comprising first and second image fields generated

from an inter-laced scan of the image (col. 12 lines 59-67), said apparatus comprising:

- A combining processor (Fig. 1, 140) operable to represent said data to be

  embedded (Fig. 1, 104) in a transform domain form (col. 13 lines 29-35), and, in

  combination with a transform processor (Fig. 1, 110), to combine (insert) said

  data (water mark data, Fig. 1, 104) to be embedded with at least one of said first

  and second fields (odd and even) of said image (101) (col. 14 lines 25-30) in one

  of:

  o A transform domain form, said transform processor (110) generating a

    transform domain form of said first and second fields (odd and even) (col.

    13 lines 38-42), said data being combined with said first and second fields

    (odd and even) by said combining processor (140) in said transform

    domain (col. 13 lines 44-53) [The transform domain form (Fig. 1, 102) of

    the original image (101) is input into the water mark inserting device

    (140).].

  o Wherein said transform domain provides a plurality of sub-bands

    (frequency components) and said data to be embedded (104) is

    introduced into at least one of said sub-bands (frequency components) of

    said at least one of said first and second fields (odd and even) of said

    image (col. 13 lines 29-35 and col. 14 lines 55-59). It is inherent in the

    DCT transformation (110) that each odd and even field is transformed into

    a plurality of frequency components. Each component represents a sub-

band and since the DCT transformation (110) takes place before the

watermark insertion (140) then it is inherent that the watermark data (104)

is inserted into at least on of these components.

Regarding Claims 2, 11, and 17: Satoh discloses an image processing apparatus as

claimed in claim 1, wherein said combining processor (140) is operable to combine data

(first water mark data, Fig. 1, 131) to be embedded with a first sub-band (content

corresponding to the odd field, which is referring to the frequency components in the

odd field) of said first field (odd field), and to combine said data (second water mark

data, Fig. 1, 132) with a second sub-band (content corresponding to the even field,

which is referring to the frequency components in the even field) of said second field

(even field) of said image data (102) in said transform or said spatial domain (col. 13

lines 44-53).

Regarding Claim 3: Satoh discloses an image processing apparatus as claimed in

claim 2, wherein said first sub-band and said second sub-band comprise mutually

exclusive spatial frequency components. It is inherent in the DCT transformation (Fig.

1, 110) that the coefficients, which are spatial frequency components, are mutually

exclusive from each other. For example, for each field there will be a set of frequency

components output by the DCT transformer (110) including a DC coefficient and

multiple frequency coefficients.

Regarding Claim 4: Satoh discloses an image processing apparatus as claimed in

claim 2, wherein said data embedded in said first sub-band includes first data (first

water mark data) and said data embedded in said second sub-band includes second

data (second water mark data), said first and second data being different (col. 6 lines 3-

10).

Regarding Claim 21: Satoh discloses a signal (Fig. 1, 106) representing an image in

which data (Fig. 1, 104) has been embedded by an image processing apparatus

according to claim 1 (col. 14 lines 50-54). See the analogous arguments as presented

for claim 1 regarding the process of embedding.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 6-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Satoh in view of Hayashi et al. (PN 6,535,616). (hereinafter Hayashi)

Regarding Claim 6: Satoh discloses the image processing apparatus as claimed in

claim 1, wherein data is introduced into a first and second sub-band of the first and

second fields (see analogous arguments made in claim 2). Satoh does not disclose that

the sub-bands represent in the transform domain low spatial frequencies in one

direction and high spatial frequencies in the other. However, Hayashi discloses an

image processing apparatus wherein a first sub-band in which data is introduced into an

image frame represents in the transform domain low spatial frequencies of said image

in one direction and high spatial frequencies of said image in another direction, and a

second sub-band in which data is introduced in an image frame represents in the

transform domain high spatial frequencies of said image in said one direction and low

spatial frequencies of said image in said another direction (col. 5 lines 3-7 and 36-50).

It is an inherent feature of a wavelet transform that the sub-bands represent low spatial

frequencies in one direction and high spatial frequencies in another. These inherent

properties are demonstrated in Figures 3 and 4 and are the result of the high pass and

low pass filters of the wavelet transformation unit (Fig. 1, 102) shown in Figure 2. It

would have been obvious to one of ordinary skill in the art to modify Satoh's DCT unit

(Fig. 1, 110) to perform wavelet transformation as taught by Hayashi. Furthermore,

Satoh suggests the use of other transformations (col. 14 lines 55-59). Although, he

does not explicitly mention a wavelet transform, it is well-known in the art that this is an

alternative to the DCT transform.

Regarding Claim 7: Satoh discloses the use of a discrete cosine transform (DCT unit,

Fig. 1, 110). Satoh does not disclose using a wavelet transform. However, Hayashi

discloses an image processing apparatus, wherein said transform processor (Fig. 1,

102) is operable in combination with said combining processor (Fig. 1, 103) to introduce

said data to be embedded (Fig. 1, 107) into said image in accordance with the wavelet

transform, of at least one of said data, said image frame and said at least one of said

first and second fields, said wavelet transform providing said plurality of sub-bands (col.

4 line 65–col. 5 line 2). It would have been obvious to one of ordinary skill in the art to

modify Satoh's DCT unit (Fig. 1, 110) to perform wavelet transformation as taught by

Hayashi. Furthermore, Satoh suggests the use of other transformations (col. 14 lines

55-59). Although, he does not explicitly mention a wavelet transform, it is well-known in

the art that this is an alternative to the DCT transform.

Regarding Claim 8: Hiyashi discloses an image processing apparatus as claimed in

claim 7, wherein said first sub-band into which said data is introduced into said at least

one of said first and second fields has one of low vertical, high horizontal frequencies

and high vertical, low horizontal frequencies sub-bands, and said second sub-band into

which said data is introduced into said image frame is the other of said low vertical, high

horizontal frequencies and high vertical, low horizontal frequencies sub-bands (col. 5

lines 42-50). These are inherent features resulting from wavelet transformation.

Regarding Claim 10: Satoh discloses the image processing apparatus as claimed in

claim 1. Satoh does not disclose modulating the water mark data with a pseudo

random symbol stream. However, Hayashi discloses an image processing apparatus

as claimed in claim 1, comprising a modulator operable to modulate a Pseudo Random

Symbol Stream with each of the data symbols to be embedded, said modulated Pseudo

Random Symbol Stream being introduced into said transform domain representation

(col. 15 lines 28-37). The random number generator modulates the coefficients, which

are the image data in the transform domain representation, with a Pseudo Random

Symbol Stream. It would have been obvious to one of ordinary skill in the art to modify

Satoh to modulate the water mark data (Fig. 1, 104) with the random number generator

provided in the quantizing circuit (Fig. 10, 1003). Furthermore, Satoh suggests the use

of random numbers in water mark embedding for the purpose of "preventing

interference of the respective water mark data even in the case of embedding a plurality

of water mark data" (col. 3 lines 14-18).

9. Claims 5, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Satoh in view of Tewfik et al. (PN 6,226,387). (hereinafter Tewfik)

Regarding Claims 5 and 12: Satoh discloses an image processing apparatus as

claimed in claim 2 having data in two sub-bands, but does not disclose the data being

the same. However, Tewfik discloses a scene-based video watermarking using wavelet

transformation wherein said data embedded in said first sub-band and said data

embedded in said second sub-band are the same data (col. 6 lines 46-50). Tewfik

explains that the frames of a scene are embedded with a consistent watermark. Tewfik

then continues to explain how these frames are wavelet transformed forming sub-bands

(wavelet frames) (col. 6 lines 52-56). Therefore two sub-bands (wavelet frames) may

be embedded with the same watermark. It would be obvious to one of ordinary skill in

the art to modify Satoh according to the teachings of Tewfik so that the first (Satoh Fig.

1, 131) and second (Satoh Fig. 1, 132) water mark data would be the same.

Furthermore, one would be motivated to make this modification to resolve pirate attacks

as expressed by Tewfik (col. 6 lines 58-59). In addition, when Satoh discloses the

water mark data to be different he is referring to the preferred invention, which implies

that the water mark data is not necessarily different and therefore could be the same

(col. 6 lines 3-10).

Regarding Claim 13: Satoh discloses an image processing apparatus as claimed in

claim 12, wherein said data items to be embedded include meta data (information for

authenticating the copyright ownership) such as a Unique Material Identifier (UMID)

(col. 1 lines 28-34).

10. Claims 14, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Satoh in view of Cox (PN 5,991,426). (hereinafter Cox)

Regarding Claims 14, 18, and 20: Satoh discloses the image processing apparatus

according to claim 1, in which watermarks are embedded into fields. Satoh does not

disclose a detection apparatus for this particular embodiment. However, Cox does

disclose an image processing apparatus operable to detect and recover data embedded

into an image by the image processing apparatus according to claim 1, said apparatus

comprising:

- A data processor (field separator, Fig. 6, 404) operable to identify at least one of

  first and second fields (Fig. 6, 404a and 404b) of said image into which data has

  been embedded (baseband video, Fig. 6, 402) (col. 7 lines 16-21).

- A transform processor (DCT conversion is performed in Fig. 6, 406) operable to

  generate a transform domain (DCT domain, DCT values, Fig. 6, 408)

  representation of said at least one of the first and second fields (404a, 404b) into

  which the data has been embedded (col. 7 lines 25-27).

- A data detector operable to detect (watermark extractor, Fig. 6, 414) and recover

  (watermark decoder, Fig. 6, 418) the data from said transform domain

  representation of said at least one of the first and second fields from the sub-

  bands into which the data has been embedded (col. 7 lines 27-30).

Allowable Subject Matter

11. Claims 9 and 15 is objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Craig W. Kronenthal whose telephone number is (571)

272-7422. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amelia Au can be reached on (571) 272-7414. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

08/12/05
CWK

JINGGE WU
PRIMARY EXAMINER